

FACT SHEET
PROPOSED REVISIONS TO THE NATIONAL AMBIENT AIR QUALITY
STANDARDS FOR NITROGEN DIOXIDE

SUMMARY OF ACTION

- On June 26, 2009, EPA proposed to strengthen the primary National Ambient Air Quality Standards (NAAQS) for nitrogen dioxide (NO₂). The proposed changes would protect public health, especially the health of sensitive populations – people with asthma, children and the elderly.
- EPA is proposing to establish a new 1-hour NO₂ standard at a level between 80 – 100 parts per billion (ppb). This standard would protect against health effects associated with short-term exposures to NO₂, which are generally highest on and near major roads. The Agency is taking comment on alternative levels for the 1-hour standard down to 65 ppb and up to 150 ppb.
- EPA is also proposing to retain the current annual average NO₂ standard of 53 ppb.
- In addition to proposing an averaging time and a range of levels for the standard, EPA is also proposing a “form” for the standard. The form is the air quality statistic that is compared to the level of the standard to determine if an area meets the standard.

For the new 1-hour NO₂ standard, EPA is proposing that the form be a 3-year average of the 4th highest daily maximum 1-hour average concentration in a year, or a 3-year average of the 99th percentile of the annual distribution of daily maximum 1-hour average concentrations. (The 99th percentile for a year corresponds approximately to the 4th highest daily maximum.)

- EPA is also proposing changes to the ambient air monitoring and reporting requirements for NO₂. Changes to the NO₂ air quality monitoring network would include:
 - monitors in locations to measure peak concentrations that occur over shorter periods of time to support the proposed 1-hour standard. These locations will typically be near major roads in urban areas because cars, trucks and other mobile sources are key contributors to the maximum outdoor NO₂ concentrations.
 - monitors in large urban areas to measure the highest concentrations of NO₂ that occur over wider areas.
- This proposed suite of health-protective standards would protect public health by reducing people’s exposure to high short-term concentrations of NO₂ – which generally occur near major roads – and assure that community-wide NO₂ concentrations remain below levels that may cause public health problems.

- As an alternative to the proposed approach, EPA is requesting comment on supplementing the current annual standard with a community-wide 1-hour NO₂ standard in the range of 50 – 75 ppb. Monitoring near major roads would not be required under this alternative.
- Also as part of this notice, EPA is proposing an approach for implementing the proposed 1-hour NO₂ standard.
- EPA will accept comments for 60 days after the proposed rule is published in the Federal Register. In addition, the Agency will hold two public hearings on the proposed rule in August 2009 in Los Angeles and Arlington, VA
- The proposed changes would not affect the secondary NO₂ standard, set to protect public welfare. EPA is considering the need for changes to the secondary standard under a separate review.

NO₂ AND PUBLIC HEALTH

- Current scientific evidence links short-term NO₂ exposures, ranging from 30 minutes to 24 hours, with an array of adverse respiratory effects including increased asthma symptoms, worsened control of asthma, and an increase in respiratory illnesses and symptoms. These effects are particularly important for asthmatics.
- Studies also show a connection between short-term exposure and increased visits to emergency departments and hospital admissions for respiratory illnesses, particularly in at-risk populations including children, the elderly, and asthmatics.
- NO₂ concentrations in vehicles and near major roads are appreciably higher than those measured at monitors in the current network. In-vehicle concentrations can be 2-3 times higher than those measured at nearby community-wide monitors. Near-road (within about 50 meters) concentrations of NO₂ have been measured to be approximately 30 to 100 percent higher than concentrations away from major roads.
- Individuals who spend time on or near major roads can experience short-term NO₂ exposures considerably higher than measured by the current network, which are of particular concern for at-risk populations, including people with asthma, children, and the elderly
- EPA's National Ambient Air Quality Standard for NO₂ is designed to protect against exposure to the entire group of nitrogen oxides. NO₂ is the component of greatest concern and is used as the indicator for the larger group of nitrogen oxides. The sum of nitric oxide (NO) and NO₂ is commonly called nitrogen oxides or NO_x. Other nitrogen oxides include nitrous acid and nitric acid.

- Emissions that lead to the formation of NO₂ generally also lead to the formation of other NO_x. Control measures that reduce NO₂ can generally be expected to reduce population exposures to all gaseous NO_x. This may have the important co-benefit of reducing the formation of ozone and fine particles both of which pose significant public health threats.
- NO_x react with ammonia, moisture, and other compounds to form small particles. These small particles penetrate deeply into sensitive parts of the lungs and can cause or worsen respiratory disease, such as emphysema and bronchitis, and can aggravate existing heart disease, leading to increased hospital admissions and premature death. EPA's NAAQS for particulate matter (PM) are designed to provide protection against these health effects.
- Ozone is formed when NO_x and volatile organic compounds react in the presence of heat and sunlight. Children, the elderly, people with lung diseases such as asthma, and people who work or exercise outside are at risk for adverse effects from ozone. These include reduction in lung function and increased respiratory symptoms as well as respiratory-related emergency department visits, hospital admissions, and possibly premature deaths. EPA's NAAQS for Ozone are designed to provide protection against these health effects.

COSTS AND BENEFITS OF A REVISED NO₂ STANDARD

- The Clean Air Act prohibits EPA from considering costs in setting or revising National Ambient Air Quality Standards (NAAQS). To inform the public, the Agency analyzes the benefits and costs of meeting the standards as required by Executive Order 12866 and guidance from the White House Office of Management and Budget.
- Based on the available data, EPA used two approaches for determining whether a given area would attain under a new near roadway monitor network. Both methods show areas that would be required to install pollution control equipment to meet an alternative standard of 80 ppb in 2020. However, for an alternative standard of 100ppb in 2020, only the first of the two methods showed areas would be required to install pollution control equipment, and we estimate no costs or benefits to occur to meet the 100 ppb standard in 2020 using the second method. Under both approaches, EPA estimates that expanding the monitoring network to include near roadway monitors would cost \$3.6m.
- To estimate the costs of meeting the proposed alternative NAAQS for NO₂, EPA analyzed the cost of reducing NO_x emissions from mobile sources.
- EPA estimates that at full implementation in 2020, the costs of the proposed revised 80 ppb alternative standard with a near roadway monitoring network would be approximately \$23 to \$600 million (in 2006 dollars). EPA estimates that at full implementation in 2020, the costs of the proposed revised 100 ppb alternative

standard with a near roadway monitoring network would be approximately \$3.6 to \$30 million (in 2006 dollars).

- To estimate the benefits of meeting a range of standards, EPA used peer-reviewed studies of air quality and health and welfare effects, and peer-reviewed studies of the dollar values of public health improvements.
- EPA calculated the benefits of avoiding various health effects that would result from a strengthened NO₂ NAAQS, including hospital admissions, emergency department visits, and asthma attacks. The estimate also includes avoided health effects expected from reducing fine particles by applying pollution controls to reduce NO₂ concentrations. These co-benefits also include reduced premature mortality, heart attacks, chronic bronchitis, and work loss days.
- EPA estimates that a revised NO₂ standard at 80 ppb with a near roadway monitoring network would yield health benefits of \$33 to \$1,300 million per year. EPA estimates that a revised NO₂ standard at 100 ppb with a near roadway monitoring network would yield health benefits of \$0 to \$56 million per year. These benefits reflect reduced exposure to fine particles resulting from a strengthened NO₂ standard.

IMPLEMENTING THE PROPOSED NO₂ STANDARDS

- EPA is also outlining the Clean Air Act requirements that states must address to implement a new or revised NO₂ air quality standard.
- EPA is proposing a schedule for implementing the proposed new standard.
- EPA will issue the final primary national air quality standard for NO₂ by January 22, 2010. If EPA promulgates a new standard for NO₂, the Agency expects to identify or “designate” areas as meeting or not meeting the standard or as unclassifiable by January 2012, within two years of the effective date of the standard. In the event of insufficient information, the Clean Air Act provides that EPA can take an additional year to designate areas.
- EPA is also proposing not to establish classifications based on the severity of air quality in the areas designated as nonattainment.

IMPLEMENTING THE PROPOSED NO₂ MONITORING NETWORK

- EPA is proposing specific minimum requirements to guide the placement of new NO₂ monitors in urban areas. These would include:
 - At least one monitor would be located near a major road in any urban area with a population greater than or equal to 350,000 people. A second monitor would be required near a major road in areas with either:

- (1) population greater than or equal to 2.5 million people, or
 - (2) one or more road segment with an annual average daily traffic (AADT) count greater than or equal to 250,000 vehicles.
- A minimum of one monitor would be placed in any urban area with a population greater than or equal to 1 million people to assess community-wide concentrations.
 - EPA also is proposing specific criteria for siting new NO₂ air quality monitors near major roads. These include identifying road segments ranked with the highest traffic levels by AADT and identifying locations where the highest peak concentrations of NO₂ are expected to occur, and placing monitors no more than 50 meters (about 164 feet) away from the edge of the nearest traffic lane.
 - EPA estimates that these proposed NO₂ monitoring requirements would require approximately 165 NO₂ monitoring sites near major roads in 142 urban areas. An additional 52 monitoring sites would be required to assess community-wide levels in urban areas.
 - Some NO₂ monitors already in operation may meet the proposed community-wide monitoring siting requirements.
 - EPA is proposing to require all new NO₂ monitors to be operational by January 1, 2013. EPA also is proposing changes to data reporting requirements.
 - EPA Regional Administrators would have the authority to require additional monitoring in certain circumstances, such as in areas impacted by major industrial point sources or a combination of sources. The Regional Administrators would also have the authority to require additional near-road monitoring in urban areas where multiple peak concentration areas may be caused by a variety of mobile source factors including fleet mix, traffic congestion patterns, or terrain. Additional community-wide monitors may be needed to support photochemical and particle pollutant assessment or air quality forecasting, and air quality index reporting.
 - Any further requirements established by EPA Regional Administrators would likely necessitate additional monitors and states are also likely to maintain operation of a portion of existing monitors to meet state-specific objectives.

BACKGROUND

- The Clean Air Act requires EPA to set national ambient air quality standards for “criteria pollutants.” Currently, nitrogen oxides and five other major pollutants are criteria pollutants. The others are ozone, lead, carbon monoxide, sulfur oxides, and

particulate matter. The law also requires EPA to periodically review the standards and revise them if appropriate to ensure that they provide the requisite amount of health and environmental protection and to update those standards as necessary.

- Nitrogen dioxide (NO₂) is one of a group of highly reactive gasses known as “oxides of nitrogen.” NO₂ forms quickly from emissions from cars, trucks and buses, power plants, and off-road equipment. In addition to contributing to the formation of ground-level ozone, and fine particle pollution, NO₂ is linked with a number of adverse effects on the respiratory system.
- EPA first set standards for NO₂ in 1971, setting both a primary standard (to protect health) and a secondary standard (to protect the public welfare) at 53 ppb, averaged annually. The Agency has reviewed the standards twice since that time, but has chosen not to revise the standards at the conclusion of each review.
- Under a judicial consent decree, EPA must complete this review of the primary NO₂ standard by January 22, 2010. The current review focuses only on the primary NO₂ standard. EPA will address the secondary standard for NO₂ as part of a separate proposal in 2010.
- All areas presently meet the current (1971) NO₂ NAAQS, with annual NO₂ concentrations measured at community-wide monitors well below the level of the standard (53 ppb). Annual average ambient NO₂ concentrations, as measured at community-wide monitors, have decreased by more than 40 percent since 1980. Currently, the annual average NO₂ concentrations range from approximately 10-20 ppb.
- EPA expects NO₂ concentrations will continue to decrease in the future as a result of a number of mobile source regulations that are taking effect. Tier 2 standards for light-duty vehicles began phasing in during 2004, and new NO_x standards for heavy-duty engines are phasing in between 2007 and 2010 model years. Current air quality monitoring data reflects only a few years of vehicles entering the fleet that meet these strict NO_x standards.

HOW TO COMMENT

- EPA will accept comment on the proposal for 60 days after publication in the Federal Register. Comments, identified by Docket ID No. EPA-HQ-OAR-2006-0922, may be submitted by one of the following methods:
 - www.regulations.gov: follow the on-line instructions for submitting comments.
 - E-mail: Comments may be sent by electronic mail (e-mail) to a-and-r-Docket@epa.gov, Attention Docket ID No. EPA-HQ-OAR-2006-0922.

- Fax: Fax your comments to: 202-566-1741, Attention Docket ID. No. EPA-HQ-OAR-2006-0922.
- Mail: Send your comments to: Air and Radiation Docket and Information Center, Environmental Protection Agency, Mail Code: 6102T, 1200 Pennsylvania Ave., NW, Washington, DC, 20460, Attention Docket ID No. EPA-HQ-OAR-2006-0922.
- Hand Delivery or Courier: Deliver your comments to: EPA Docket Center, 1301 Constitution Ave., NW, Room 3334, Washington, D.C. Such deliveries are only accepted during the Docket's normal hours of operation, and special arrangements should be made for deliveries of boxed information

FOR MORE INFORMATION

- To download a copy of the final rules, go to EPA's Web site at: <http://www.epa.gov/air/nitrogenoxides>.
- Today's proposed rule and other background information are also available either electronically at <http://www.regulations.gov>, EPA's electronic public docket and comment system, or in hardcopy at the EPA Docket Center's Public Reading Room.
- The Public Reading Room is located in the EPA Headquarters, Room Number 3334 in the EPA West Building, located at 1301 Constitution Avenue, NW, Washington, DC. Hours of operation are 8:30 a.m. to 4:30 p.m. eastern standard time, Monday through Friday, excluding Federal holidays.
- Visitors are required to show photographic identification, pass through a metal detector, and sign the EPA visitor log. All visitor materials will be processed through an X-ray machine as well. Visitors will be provided a badge that must be visible at all times.
- Materials for this proposed action can be accessed using Docket ID No. EPA-HQ-OAR-2006-0922.